



Department of Administration
Office of Environmental Sustainability

Tom Barrett
Mayor

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Director

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WHO: City of Milwaukee Office of Environmental Sustainability

WHAT: Proposal to site a wind turbine on Port Authority

WHEN: Fund Must Be Committed to a Project by April 25, 2011

WHERE: Two options:
1) 2330 South Lincoln Memorial Dr: Confined Disposal Facility (CDF) next to car ferry
-OR-
2) 2323 South Lincoln Memorial Dr: Port Administration Building

WHY: High-visibility demonstration of the City's commitment to renewable, clean energy; reduce City's energy costs and improve air quality; and supports the Port's strategic objectives.

HOW: Federal funds allocated for energy efficiency or renewable energy projects in the City of Milwaukee

ABOUT US: The Office of Environmental Sustainability (OES) promotes both economically viable and environmentally sound practices, projects and initiatives. The Office works with City departments and the community to save taxpayer dollars by reducing energy bills in city buildings and in citizens' own homes and businesses. The Office of Environmental Sustainability is 100% funded by grants. Since 2006, OES has successfully attracted more than \$20 million in grant funding to Milwaukee to help create an environmentally and economically sustainable community.

FREQUENTLY ASKED QUESTIONS

How many turbines are you considering?

A. The City of Milwaukee is considering one turbine at one of two potential sites at the Port of Milwaukee.

How tall will it be?

A. At the time of the first public meeting, the City was considering one of two *small- scale* turbine models:

Option 1: Renewegy 20 kW turbine has a 100 ft tower. Total height from the ground to the highest extension of the blade is 115 ft. <http://www.renewegy.com>

Option 2: Northern Power 100kW turbine has a 120 ft tower. Total height from the ground to highest extension of the blade is 154 ft. <http://www.northernpower.com>

Is this like the turbines on the wind farms I see from the highway?

A. No. The utility scale turbines owned and operated by We Energies in Fond du Lac County at the Blue Sky Green Field Wind Energy Center have 262 foot towers (nearly the height of Bay View Terrace) and are 397 feet from the ground to the highest blade tip (10 ft shorter than the 411 building on Wisconsin Avenue).

The City is proposing a single wind turbine that is less than half the height of the utility scale turbines in the Fond du Lac wind development. While the small-scale turbine being proposed by the City is significantly shorter than utility scale turbines, the City turbine will have the same sleek and modern appearance.

Where do you want to put this?

A. The City is exploring two possible site options for construction of one small-scale turbine, on City-owned land near the lakefront: next to the Port Administration building at 2323 S. Lincoln Memorial Drive or next to the Lake Express Ferry terminal building on what is known as the “Confined Disposal Facility” (CDF).

Why did you pick those sites?

A. These sites are at the top of the list because they (1) are high visibility sites and would be a bold demonstration of the City’s commitment to renewable energy, (2) are located in an open area, (3) are located squarely on City-owned property and comply with Public Service Commission siting guidelines, (4) would power a City-owned facility as required by the federal grant guidelines, and (5) most importantly, the wind resource at these sites is among the best in the region.

Is it windy there?

A. Yes. The site assessment indicates that the average wind speed at the Port Administration building is 10.7 mph at 100 ft and 11.4 mph at 120 ft. The average wind speed at the CDF site is 12 mph at 100 ft and 12.6 mph at 120 ft. The CDF site has a better wind resource because there is less air turbulence.

I heard wind turbines do not produce energy 24/7. Is that true?

A. Yes. Wind turbines only produce power when the wind provides enough force to turn the blades. The Port Administration building will remain connected to the grid and receive electricity from conventional sources when the wind is not blowing. Based on our research with Focus on Energy, we anticipate the Northern Power 100 kW machine would produce energy about 80 percent of the time.

However, the City (and ultimately the taxpayer) is billed on the net amount of energy the city facility uses from conventional sources. This bill is reduced by the amount of power generated by the wind turbine, and if the turbine produces more energy than the city building uses, the City will actually receive revenue from the utility company (net metering).

I heard this is a “demonstration project.” If this project is approved, will the City be proposing additional turbines on the Lake?

A. No. The City only has funding for one single, small-scale turbine. However, the City is “demonstrating” its commitment to a clean energy future. The city’s landscape is currently marked by smokestacks and coal piles that are a legacy of past choices about energy. With this project, the City seeks to demonstrate that we are committed to meeting our energy needs in a clean, sustainable manner.

I heard the Confined Disposal Facility (CDF) has contaminated soil. Why is it there?

A. Milwaukee's CDF was designed and constructed by the US Army Corps of Engineers (USACE) in 1975 under Section 123, River and Harbor Act of 1970. The CDF was originally designed to manage 10-years volume of dredged material and is now being designed to handle an additional 20 years of material.

The USACE has operated the facility since that time and has managed contaminated sediments dredged from Milwaukee waterways in order to maintain safe navigation channels. The facility is currently being designed for vertical expansion.

There must be a local sponsor for the CDF and, in the case of Milwaukee, the City is the sponsor providing 25% of the funds for the construction of the CDF or if the USEPA certifies that the area is in compliance with an approved water quality program.

The dredged materials in the CDF are contaminated with polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and diesel range organics (DRO) that exceed state regulatory standards.

In order for the car ferry terminal to be constructed, the Wisconsin Department of Natural Resources (WDNR) issued a permit to "construct on an abandoned landfill." This process would have to be followed to construct a wind turbine on the CDF.

Is the CDF safe for construction?

A. Currently, public access to the CDF site is not allowed, and is fenced off to the community. If construction on this site moves forward, a geotechnical engineer will assess the structural needs for the turbine (i.e. piling depth) and a hydrogeologist will assess if the contaminants might move with the piling installation. Early indication from WDNR staff is that the project would be managed similar to the Lake Express Ferry Terminal where a permit to construct on a landfill would be applied for and issued by the State.

Will it power the Port Administration building?

A. Yes. The electricity generated by the wind turbine will off-set the electrical consumption for the City-owned Port Administration building. Conservative estimates indicate that one turbine option could provide 110-150% of the building's energy needs while the other turbine option could provide 10-18% of the building's energy needs.

Will a new utility meter have to be installed?

A. Yes. We Energies requires a secondary meter to be installed which allows the City to sell extra electricity back to the grid. That new meter would be adjacent to the existing meter at the Port Administration building. If a wind turbine was constructed on the CDF, a power line to the Port Administration building would run underground.

What about the Public Trust Doctrine? Does it apply to this project?

A. The public trust doctrine is inapplicable to the site adjacent to the Port Administration building because virtually all of that land is not lakebed. The public trust doctrine is applicable to the second site, the CDF. The public trust doctrine appears to give broad and liberal, but not unlimited, degree of discretion to the City in its selection of permitted uses for these lands. The wind turbine would directly power the Port Administration building and enhance the Port Authority's operational efficiency. The wind turbine would thus be located on a site (the CDF) the WDNR has determined is an acceptable use under public trust. The CDF itself is currently off limits to the public.

Will this impact planes landing and taking off from General Mitchell Airport? Will it impact the lakefront Air Show? South Shore fireworks?

A. No. The Federal Aviation Administration has issued a “determination of no hazard” to air traffic. The FAA review is required for construction of any buildings/objects within a certain radius of an airport. See final FAA determination: <http://city.milwaukee.gov/ImageLibrary/Groups/cityGreenTeam/documents/FAAApproval.pdf>

A representative of the Milwaukee Air & Water Show stated at the public meeting that the wind turbine would not affect the air show. The City also foresees no impact on the South Shore Frolics annual fireworks show.

Is there an impact on weather Doppler radars?

A. No. According to the National Weather Service, one small-scale wind turbine like the City is considering would not interfere with Doppler radar systems. The NWS Meteorologist for Milwaukee determined: “Radar returns from wind turbines are something we in the National Weather Service (NWS) routinely deal with as part of our job. We (NWS) have been in contact with the agency (City of Milwaukee-Office of Environmental Sustainability) considering installing a wind turbine in Milwaukee harbor and we have determined that it will have no negative impact on NWS operations.”

Is the Coast Guard aware of this?

A. Yes. The City has corresponded with Deputy Commander Schenk, U.S. Coast Guard, Sector Lake Michigan and his office has not responded with any concerns.

Will a wind turbine on the CDF interfere with ship radar systems?

A. We are currently working with the US Coast Guard, Focus on Energy, and Lake Express Ferry representatives so all parties involved can be assured the wind turbine will not interfere with radar or communications with ships.

What does the Board of Harbor Commissioners think of this proposal?

A. The Board of Harbor Commissioners is supportive of the project. On December 14, 2010, the Board Harbor of Commissioners voted unanimously to direct Port Authority staff to continue working with the City’s Office of Environmental Sustainability to conduct site and economic analysis on the best option for construction of a wind turbine on Port Authority property.

A wind turbine also supports the Board of Harbor Commissioners long-term strategic goals for the Port and future development both in terms of improving the Port’s environmental sustainability but also in terms of supporting industry and commerce in the renewable energy sector in the Port.

I would prefer a coffee shop or a park on these sites, not a wind turbine. What are the future redevelopment possibilities on the sites the City is considering?

A. Residential and commercial development is not permitted on either lot, nor will it likely ever be. At this time, there are no future redevelopment plans for the CDF or the Port Administration building. If anything were to ever be built on either site, it would probably be very similar to what is there now, office buildings related to port uses.

The Port Redevelopment Plan envisions of a mix of light industrial, office and research uses west of the harbor and continued heavy industrial port operations east of the harbor.

Does this fit under City zoning guidelines?

A. Yes. Based on the preliminary information we have gathered to date, the proposed wind turbine at the Port site would be classified as a “power generation plant” under the current zoning definitions. There are no height restrictions, so the proposed maximum height of 154 ft would conform.

Would Governor Walker’s proposed changes to wind sighting rules impact this project?

A. No. The regulatory changes the Governor is proposing only affect larger, utility-scale turbines. Wind turbines that are 100 kilowatts (kW) and less, like the two options the City is considering, face a different, less restrictive set of state guidelines. Follow this link to read the Public Service Commission’s wind siting rules. The rules for small-scale wind systems are the last three pages of the report.

What is your budget?

A. The total project cost is expected to max out at \$550,000-\$600,000. The City’s Office of Environmental Sustainability has approximately \$400,000 in federal grant funds set aside for a high-visibility demonstration of the City’s commitment to renewable energy. The remainder of the costs would be covered through a combination of incentives and grants from We Energies and Focus on Energy.

Who is paying for it?

A. The City’s Office of Environmental Sustainability is funding this project through federal grant dollars the U.S. Congress set aside specifically for energy efficiency and renewable energy projects in the City of Milwaukee. The grant is known as the Energy Efficiency and Conservation Block grant issued by the U.S. Department of Energy as part of the American Recovery and Reinvestment Act. The City would not take on any debt or financing in order to construct this turbine.

Who will own the turbine?

A. The City of Milwaukee will own the turbine. It will power the City’s Port Administration building.

Instead of spending this money on a wind turbine, you should spend it on energy efficiency of City operations.

A. The \$400,000 comes from a larger Energy Efficiency and Conservation Block grant from the U.S. Department of Energy in the amount of \$5.8 million. The City is spending the balance of these funds (1) on basic energy efficiency upgrades, like lighting and HVAC, on City facilities, (2) on energy efficiency upgrades on businesses in Milwaukee and (3) on development of an energy efficiency upgrade program for City residents.

Can you spend the money on something less visible?

A. The Mayor and the Common Council have approved setting aside this small portion of the Energy Efficiency and Conservation Block grant for the specific purpose of “high visibility projects on City property.”

Can the money be spent on local roads instead of a wind turbine?

A. No. The federal funds have strict guidelines as to how the funds can be spent. Energy efficiency grant funds cannot be redirected to other City operating accounts.

How much will constructing a wind turbine cost?

A. Since the City has made no final decision on this proposal, we cannot at this time provide a final budget estimate. As indicated in a previous question, the City's Office of Environmental Sustainability has approximately \$400,000 in federal grant funds set aside for a high-visibility demonstration of the City's commitment to renewable energy.

What are the financing terms of this project?

A. This project will be paid in full from day 1 with federal grant dollars. Since the funds are federal grant dollars, the City will have no debt or financing burden related to construction of this project.

When would this turbine pay for itself?

A. The turbine, tower, and maintenance costs over its estimated life would all be paid for up front, through a federal grant. That means, starting on day 1, the City of Milwaukee will start reaping the benefits of this clean energy source. The Office of Environmental Sustainability values the economic viability of this investment, will ensure a smart federal investment, and will work to have a payback within 15 years.

Once the City can publicize final pricing data and budgets, we will do so.

How long will this wind turbine produce energy?

A. Both wind turbine options the City is considering have a useful life of 25 years. The towers are typically built to last up to 100 years. The City will have the option at the end of the first 25 years to refurbish the turbine and extend the useful life of the turbine to possibly 100 years, or dismantle the turbine and tower.

Who will pay for maintenance and operation costs?

A. The City will negotiate these costs for the useful life of the wind turbine as part of the contract for the total budget. In other words, these costs will be paid for up-front and repairs and maintenance will be covered by a general warranty.

This money comes from the federal government? Why don't you return it?

A. The City will not return these funds. Historically, Wisconsin has a low return on every dollar it sends to Washington, DC through taxes paid to the federal government. This money is helping the City, businesses and residents cut their monthly energy bills. In fact, the City is leveraging a portion of this grant to attract millions in private capital to fund the City's residential energy efficiency upgrade program (known as *Milwaukee Energy Efficiency* or Me²). For more information: www.smartenergypays.com). In addition, a portion of these funds has already helped 11 companies in Milwaukee finance energy efficiency upgrades on facilities that will save them money.

What if we need to dismantle it?

A. If for some reason the City wants or needs to dismantle the wind turbine, research has shown that selling the parts for scrap and/or reuse can cover the cost of dismantling a wind turbine.

This is too small to make much of a difference – it's a token effort.

A. In these economic times, every dollar and every job counts. Each unit of energy generated by oil and coal

represents dollars that leave the state. Further, the purchase of this turbine will support American jobs both at the American manufacturing facility and for the installers and maintenance/operations staff here in Milwaukee.

What is the potential for cost overruns on this project?

A: The City's Office of Environmental Sustainability has set aside approximately \$400,000 for this project. Wisconsin Focus on Energy and We Energies incentives and grants will make up the difference between this amount and the total cost. The City will write the contract to not allow for any City liability for cost overruns for the turbine to not exceed the \$400,000 of federal funds allocated to the project.

Who in City government still needs to approve this project?

A: The Mayor and the Common Council have already given approval to spending plans for the grant which would fund this high visibility project. The Mayor and the Common Council's input would be needed before a final spending plan is developed for the wind turbine project. The Board of Harbor Commissioners would also need to approve the final plan.

Don't we have too much energy generation capacity in the state? Why should the City do We Energies' job of providing electricity generation?

A: The strong potential exists for the Port turbine to provide revenue to the City from electricity sales to the grid. The Port Administration building's energy costs will be reduced and therefore the City's need to allocate property tax dollars to pay its energy bills will be reduced. The Port turbine is a smart energy investment which is wholly unrelated to the energy generation capacity of the state.

Will I be able to safely walk underneath the turbine when I walk my dog?

A: The two turbines we are evaluating have been successfully installed and currently operate in parking lots, near schools, homes and businesses where people work and play every day. Currently, public access to the CDF site is not allowed. The City has investigated the perceived safety hazards of a small-scale wind turbine (ice throws, thrown blades, falling towers), along with the safety records of the proposed manufacturers and installers. Based on this analysis, the City is confident that the urban, small-scale wind turbine poses no significant safety hazards to those in the vicinity of the CDF or Port Administration building property.

How will this impact my property taxes?

A: Because the installation and maintenance costs of the Port turbine will be paid for from federal grant funds, the turbine will have no negative impacts on the City property tax levy. The reduced electricity expenses of the Port building, along with revenue from potential electricity sales to the grid, will actually lower the City's energy budget, saving local taxpayer dollars in the long-run. The energy savings from the Port turbine will be significant yet the Port electricity bill is small relative to the overall City electricity budget.

How will this affect my property value?

A: We expect no impact to property values due to the proposed turbine. There are no readily available studies that address the impact of a single, small-scale wind turbine on property values. Several major studies have been conducted looking at the impact of large, utility-scale wind farms on local property values. The most cited is a 2009 National Renewable Energy Laboratory study, "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis," which is the most comprehensive nation-wide study done to date.

Even though this study focused on large, utility-scale wind farms (which the single, small scale Port turbine is not), the NREL study “*found no conclusive evidence of the existence of any widespread property value impacts in communities surrounding wind energy facilities...neither the view of the wind facilities nor the distance of the home to those facilities has any "consistent, measurable, and statistically significant effect on home sales prices."*

Complete NREL study can be found here: <http://j.mp/NRELstudy>

An article from Wisconsin’s *Daily Reporter* on the NREL study can be found here: <http://j.mp/DRwind>

What about spending this money on a solar project?

A. The City of Milwaukee has a robust solar program, *Milwaukee Shines*, which has made a significant investment in advancing solar in the City by funding solar installations on City facilities and on buildings throughout the community, training professionals, and supporting our solar manufacturing base. For more information on the solar program visit www.MilwaukeeShines.com

The City now has an opportunity to show its commitment to other proven clean energy technologies. This would be a first for the City of Milwaukee: providing a high-visibility demonstration project that showcases a successful application of a proven technology, with a proven payback. Investments in renewable energy are always site specific and driven by the appropriate technology for the location. On this particular site, a wind turbine is a more viable technology than solar, with a shorter payback on our investment. In this instance, wind is the best way to go to ensure the best bang for our buck.

I heard turbines are noisy?

A. Sound from a small-scale wind turbine comes from two sources: the drive train and the blades. The sound from a wind turbine decreases with the distance from its source by the square of that distance. That is, a noise at 200 feet will have only one-fourth of the intensity as that same sound heard from 100 feet away. Sound emitted from a wind turbine quickly blends into the background noise of the urban environment with increasing distance from the tower. For example, in Fort Atkinson there are homes literally across the street from a Northern Power 100kW (few hundred feet away) and they have said they do not hear the machine at all. Sound also travels in the direction of the wind. According to the wind site assessment, the prevailing westerly and southwesterly winds mean generally, that turbine sounds will be carried away from the nearest residences.

A university led study on sound from wind turbines, small and large, can be found here:

<http://milwaukee.gov/ImageLibrary/Groups/cityGreenTeam/documents/AddressingWindTurbineNoise.pdf>

How loud will it be?

A. Both companies we are evaluating for a wind turbine have provided us with independent sound testing results to get an idea of the decibel levels from their turbines.

- Northern Power 100 kW, with direct drive turbine: Less than 55 dBA (decibels) at base of the tower
- Renewegy 20 kW, with gear box turbine: Less than 55 dBA about 100 ft from tower

For comparison:

- Lawn Mower: 107 dBA at three feet away
- Inside a car: 70 dBA
- Conversational speech: 60 dBA at three feet away
- Average home during day: 50 dBA
- Quiet bedroom at night: 30 dBA

Please click on this link for typical average decibel levels of common sounds: <http://j.mp/soundlevels> or for graphic: <http://milwaukee.gov/ImageLibrary/Groups/cityGreenTeam/documents/SoundScale.png>

Northern Power specification sheet: <http://www.northernpower.com/pdf/specsheet-northwind100-us.pdf>

Northern Power acoustic sound details:

<http://milwaukee.gov/ImageLibrary/Groups/cityGreenTeam/documents/A03008-NW100AcousticNoise.pdf>

Northern Power sound profile: <http://www.northernpower.com/community-wind/quiet-operation.php>

Renewegy specification sheet: http://www.renewegy.com/sitebuildercontent/sitebuilderfiles/renewegy_vp-20_turbine_brochure_2010.pdf

Renewegy video with sound levels: http://www.youtube.com/watch?v=fnPNM_FBMC4&feature=related

Will being near water amplify the sound?

A. There have been no studies that indicate that being *near* the water will amplify the turbine sound. On flat and still water, sound may carry better; however, since Lake Michigan is usually not flat and still, sound dampening may actually occur: <http://www.americanboating.org/sound.asp>

Elevation is also a factor to any possible sound amplification. Air near the water surface is cooler and, via refraction caused by the cooler air, could travel a bit better. But it is not clear that this occurs more than a meter or so above the water, much less in a situation where a turbine is on land at 100 +feet above and *next* to the water.

Are these turbines safe?

A. Wind energy has been a proven clean energy technology for generations. The good news is that over the past few decades small-scale and utility scale wind manufacturers are not only increasing the efficiency of wind turbines, but the safety and reliability as well.

Both turbine companies have had their turbine and tower independently field tested to ensure not only correct power estimates but proven endurance in the elements as well. Both turbines we are considering have been installed in various locations around Wisconsin, and around the country for that matter, with no safety issues including schools.

Is ice build-up a concern?

A. Ice can build up on a wind turbine just like any other structure or tree. But the ice will do one of two things: As it starts to build up on the blades, the ice will ruin the aerodynamics of the blades (like ice on a wing of a plane) and the blades will not spin. As ice first starts to collect on the blades, it doesn't collect evenly, which makes an imbalance in the weight and springing. That gives the turbine a cue to shut down. Further, Focus on Energy representatives have not heard of any turbine in Wisconsin or upper Midwest having issues with ice throws.

Please see this link to a German study on risk assessment from ice throws:

<http://milwaukee.gov/ImageLibrary/Groups/cityGreenTeam/documents/AssessmentRiskofIceWind.pdf>

How will this impact birds?

A. Small-scale wind turbines pose little, if any, threat to birds. They are simply too small. In addition, one single turbine poses even less risk than several turbines sited together. According to studies done by Wisconsin's Focus on Energy and the American Wind Energy Association, utility scale turbines are responsible for about 1-2 bird deaths per year per turbine. Those are the largest type of turbines, sited together in large clusters. What the City of Milwaukee is considering is smaller in scale and will have less of an impact.

According to the Smithsonian National Zoo, the lowest level migratory birds tend to fly is at 200 feet and non-migratory birds fly well below that level. The tallest wind turbine we are considering is 154 ft. (85 ft clearance on smallest option from ground to bottom of blade).

Focus on Energy has provided an analysis of the percentage of annual bird fatalities by source to help put the discussion in perspective:

- 55% of bird deaths come from buildings and windows
- 10% of bird deaths come from cats
- 8 % of bird deaths come from high tension lines
- 7 % of bird deaths come from vehicles
- 7 % of bird deaths come from pesticides
- 2.5% of bird deaths come from communication towers
- .1-.2% of bird deaths come from wind turbines (majority of these being utility scale wind farms)
- 10% come from other sources

The bottom-line from EPA, Department of Natural Resources, and Focus on Energy is that small-scale; single turbine projects do not create a concern for bird populations. This is true for regular birds as well as migratory bird populations. Focus on Energy compiled a fact sheet about birds and wind turbines specific to Wisconsin: http://www.focusonenergy.com/files/Document_Management_System/Renewables/windturbinesandbirds_factsheet.pdf

I think this turbine is ugly and will ruin my view.

A. Aesthetics are a matter of opinion. Something that strongly appeals visually to one person may invoke a completely opposite reaction in another. Many people report that they find wind turbines aesthetically appealing. Many supporters of this project have expressed the opinion that one sleek, clean energy producing wind turbine would be a welcome addition to the Milwaukee skyline.

We have provided photo renderings of the turbine proposals to give you an idea of what this turbine will look like. The tallest option the City is considering would hardly dominate the view from Cupertino Park at the base of Bay View Terrace or from the north in Veterans Park. To put the discussion in perspective:

- Northern Power 100kW turbine height to tip of blade: 154 ft
- Renewegy 20kW turbine height to tip of blade: 115 ft
- Bay View Terrace is about 275 ft
- MMSD smoke stake is about 350 ft

In addition, Environmental Sustainability Director Matt Howard and Alderman Zielinski have visited a north facing unit on the 23rd floor of Bay View Terrace in order to better appreciate the aesthetic concerns of citizens.

The lakefront is sacred; why the lakefront?

A. The lakefront is simply where the wind is. Investments in renewable energy are always site specific and driven by the appropriate technology for the location. When evaluating best locations in the city, on City owned property, Port Authority property quickly rose to the top of the list. The amount of electricity we can generate with a wind turbine is based on how much wind is available. The lakefront has an above average wind resource, with few obstacles or obstructions blocking the wind.

But the lakefront location not only gives us the most bang for our buck, it is a visible renewable energy project that can remind us all of our commitment to be more energy efficient and responsible stewards of the environment. With this location we are also able to stay nearly a half-mile from residences, while highlighting the goals of the Port of Milwaukee to support a growing renewable energy sector.

What other locations did you consider?

A. Other City owned properties were given a cursory evaluation utilizing wind resource maps and input from Wisconsin's Focus on Energy program. Considerations were given to obstructions such as highways, buildings or structures that will reduce the wind resource. These considerations eliminated sites such as the Menomonee Valley and Summerfest grounds. Small-scale wind turbines must power a facility with an adequate electrical load - meaning we could not place a tower within the City with nothing for it to power.

The two locations we are currently considering (the Port Administration building and the CDF site) received the certified site assessment required by Focus on Energy to apply for the cash-back reward.

While the Certified wind site assessor provides a detailed evaluation of the wind resource, here is a link to general wind maps from Focus on Energy to give you an idea of the wind resource throughout the region:

<http://www.focusonenergy.com/Information-Center/Renewables/Wind-Maps-Data/>

What about flicker effect from the blades?

A. These small-scale wind turbines will not create a shadow or flicker effect on any residences primarily because the homes would be too far away from the turbine (the maximum shadow cast would be about 500').

A lot of the questions or discussions on flicker come from utility scale turbines. Utility-scale wind turbines can cause a shadow flicker periodically, if a number of circumstances occur simultaneously. The sun must be very low in the sky, either rising or setting, and at the proper angle relative to a residence. These circumstances might last for minutes on any given sunny day, and occur only a few days per year for any given location. Neither Focus on Energy nor the Wisconsin Department of Transportation has received complaints from travelers on I-43 or I-45 about early morning flicker from the much larger, utility-scale wind turbines along the roadway.

While the shadow flicker effect sometimes reported from a utility scale turbine, the effect is virtually unknown with small-scale wind turbines like the one the City is considering. In addition, if flicker existed, the rotation speed of blades for these small-scale wind turbines would render it unnoticeable.

Can students use this as a learning tool?

A. Yes. The City of Milwaukee's wind turbine can play a role in educating our entire community including youth, secondary education students, and area home and business owners. The City will display energy generation information to the public via the web application and will provide signage at the Port to inform the public about the environmental and economic benefits of the turbine. The City has also offered to work with a local university to scientifically study the impact and output of the turbine.

I want to register my opinion on this proposed project. How do I do that?

A. We would like to hear from you. Please send comments to the City's Office of Environmental Sustainability at sustainability@milwaukee.gov or to Alderman Tony Zielinski at tziel@milwaukee.gov

ADDITIONAL INFORMATION AND RESOURCES

Government and State Energy Links

Office of Environmental Sustainability <http://www.milwaukee.gov/sustainability>
Alderman Tony Zielinski <http://city.milwaukee.gov/district14>
Port of Milwaukee <http://city.milwaukee.gov/port>
Wisconsin Focus on Energy <http://www.focusonenergy.com>

Renewable Energy Organizations

Midwest Renewable Energy Association <http://www.midwestrenew.org>
Renew Wisconsin <http://www.renewwisconsin.org>
American Wind Energy Association: <http://www.awea.org>

Wind Turbine Options

Renewegy <http://www.renewegy.com>
Northern Power Systems <http://www.northernpower.com>

Wind Specific Fact Sheets and Resources

WI Small-Scale Wind Fact Sheet <http://j.mp/WIwind>
WI Wind and Birds Fact Sheet <http://j.mp/eAzyjd>
We Energies Bird and Bat Study <http://j.mp/WEbird>
Audubon Society statement on wind <http://j.mp/AudubonWind>
Bird and Bat Study from Lake Erie <http://j.mp/eriebird>
AWEA report on wind and radar <http://j.mp/awearadar>
Wind Power at State Park article <http://j.mp/statepark>
Wind and Property Values presentation <http://j.mp/propertyPPT>
WI PSC Wind Siting Standards
Small wind rules on LAST 3 PAGES <http://j.mp/PSCrules>

Other Multi-Media

TV story on Northern Power turbine at MATC-Fort Atkinson <http://www.wkow.com/Global/story.asp?S=12399224>

Real-time data for Northern Power turbine at MATC-Fort Atkinson <http://siteapp.fatspaniel.net/siteapp/simpleView.jsf?eid=426705>

Real-time data for Northern Power Turbine at Wausau East High School <http://northernpower.kiosk-view.com/wausau>

Video from Renewegy Installation at Renewegy's HQ http://www.youtube.com/watch?v=fnPNM_FBMC4&feature=related

Video from Renewegy Installation at Orion Energy Systems <http://www.youtube.com/watch?v=pIT0OllVmJs&feature=related>